Context Sensitive Design -- The Path Forward

Presentation to 'Safety, Aesthetics and Community Partnerships: Context-Sensitive Solutions'

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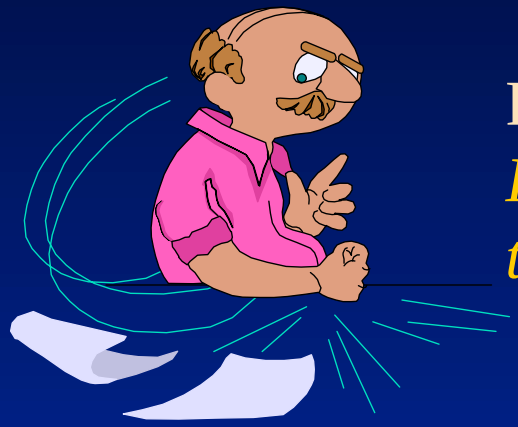
What is holding us back from fully implementing Context Sensitive Design?

- Awareness and attitude shift
- Skill development
- Management and organizational barriers
- External support from key stakeholders

Our First Challenge -- The Attitudes of staff should reflect CSD philosophy



FROM THIS: *"We can't do that! If we give them what they want they'll expect that every time"*

TO THIS: *"We (The highway department) don't have all the answers"*

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Changing imbedded cultural attitudes is a challenge

- **Does your staff refer in public to to '*our* project/highway, etc.'?**
- **Do your staff use terms or jargon that support CSD?**
  - **is it a 'lane widening improvement project'; or a *safety project* (or perhaps a *traffic operational improvement project*)?**

The cultural shift in public and agency involvement

Old PI Model

- Our (the DOT's) public involvement plan is intended to 'sell the public on what we (the DOT) want to do'

Context Sensitive PI Model

- The project team's public involvement plan is intended to confirm and refine problem definition, understand local issues, articulate choices and help shape the project's alternatives

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Skill Development Needs to Support CSD

- Project management
- Operational effects of roadway design
- Facilitation and communications
- Creativity

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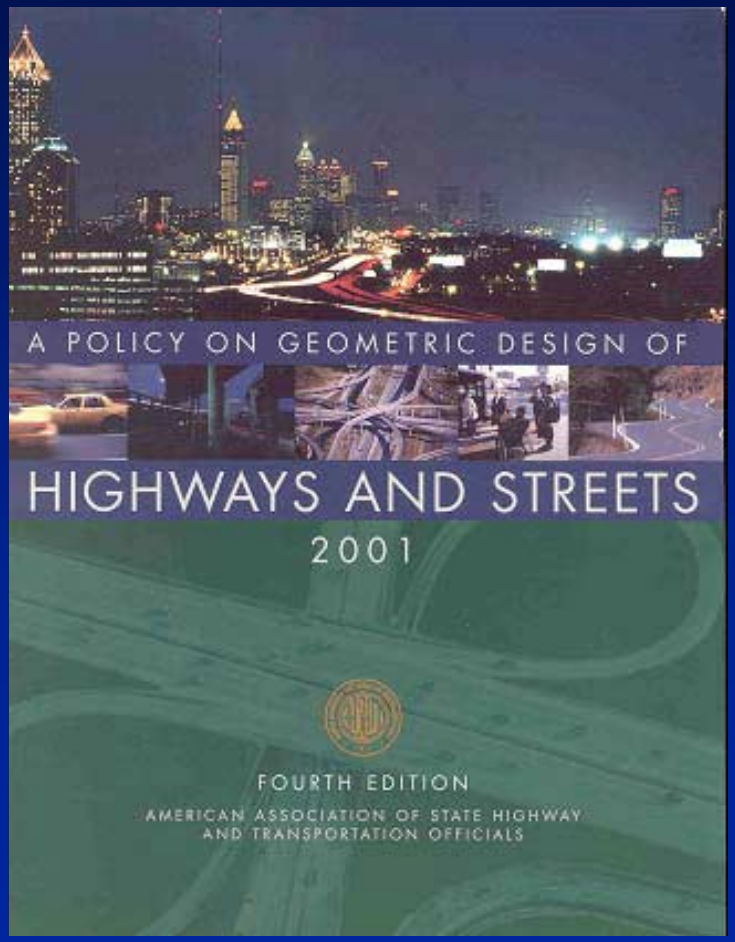
Knowledge our design and technical staff need to be successful at CSD



- Background on AASHTO Green Book basis
- Understanding of 'substantive safety'
- Knowledge on operational effects of geometric design

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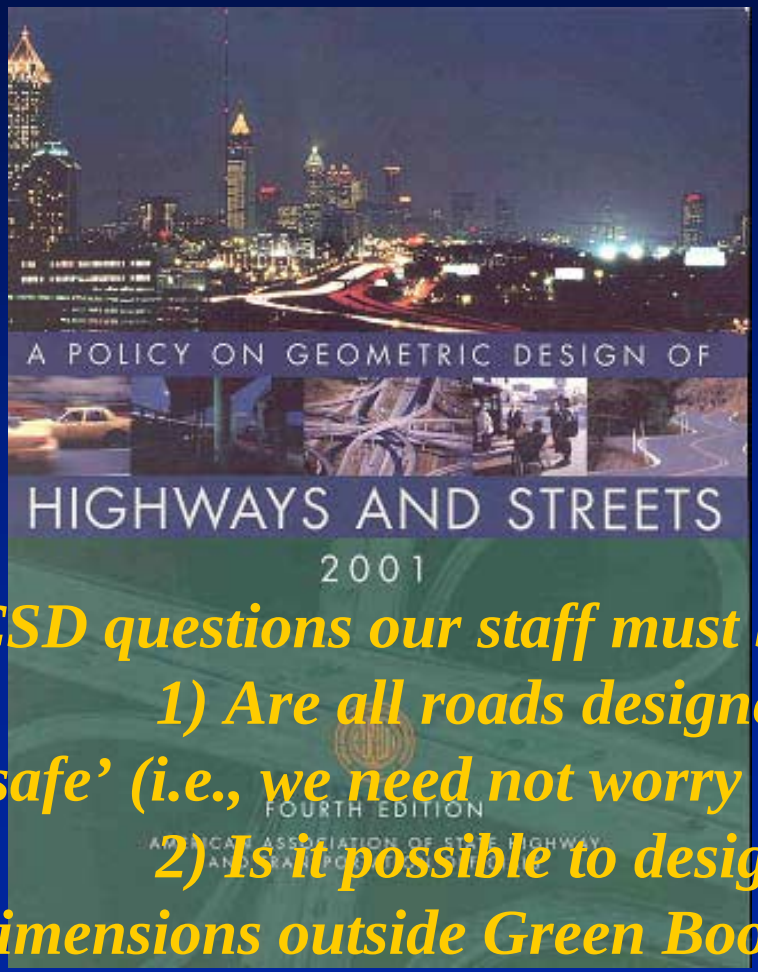
Nominal safety represents just one dimension of the problem



'Everything one needs to know about how to design a safe highway is in the Green Book'

CSD questions our staff must be able to address:

1) Are all roads designed to meet full criteria 'safe' (i.e., we need not worry about their performance)?

2) Is it possible to design a 'safe' road with dimensions outside Green Book criteria?

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Knowledge of *substantive safety* must also be in our designer's toolbox

Source: NCHRP Report 400

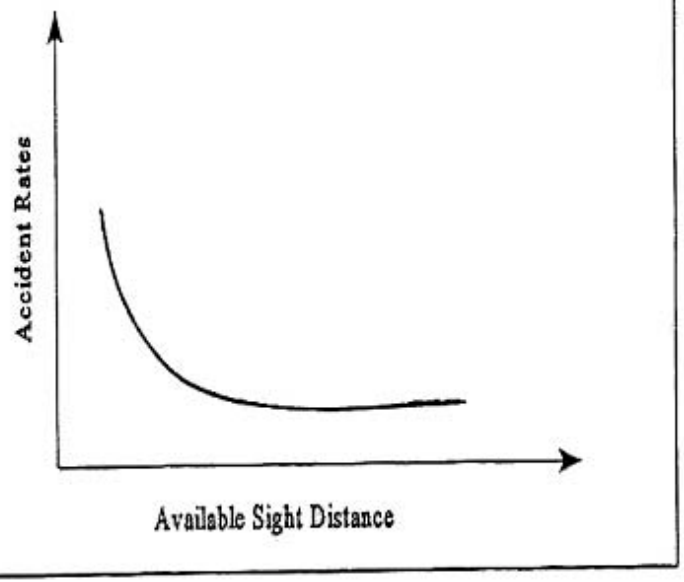


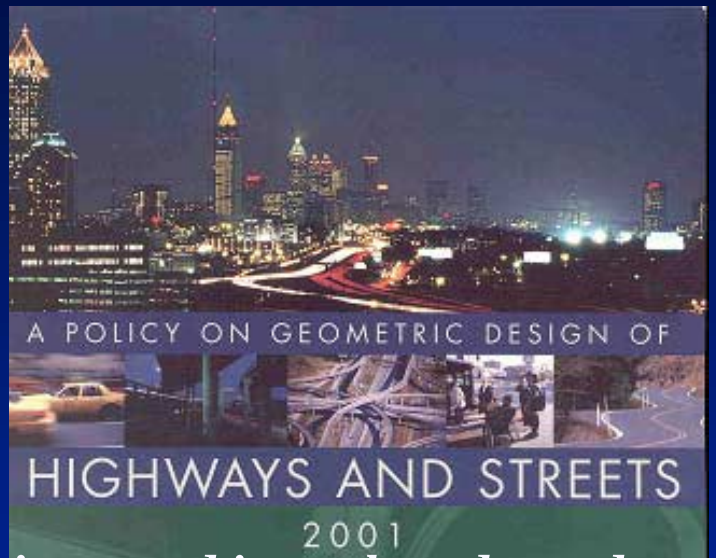
Figure 4. Conceptual Relationship Between Available Sight Distance and Safety at Crest Vertical Curves

Substantive safety

- –is a continuum
- –may or may not be related to nominal safety
- –relationship to nominal safety can vary widely for geometric elements

Highway safety is multi-dimensional; making difficult design compromises or trade-offs demands we fully understand all safety consequences

The 21st Century 'Context Sensitive' Highway Engineer



"Design speed is a selected speed used to determine the various geometric design features of the roadway. The assumed design speed should be a logical one with respect to the topography, the adjacent land use, and the functional classification of highway."

Recognizes and embraces roadway design as a series of *choices*; not the assembly of mandates

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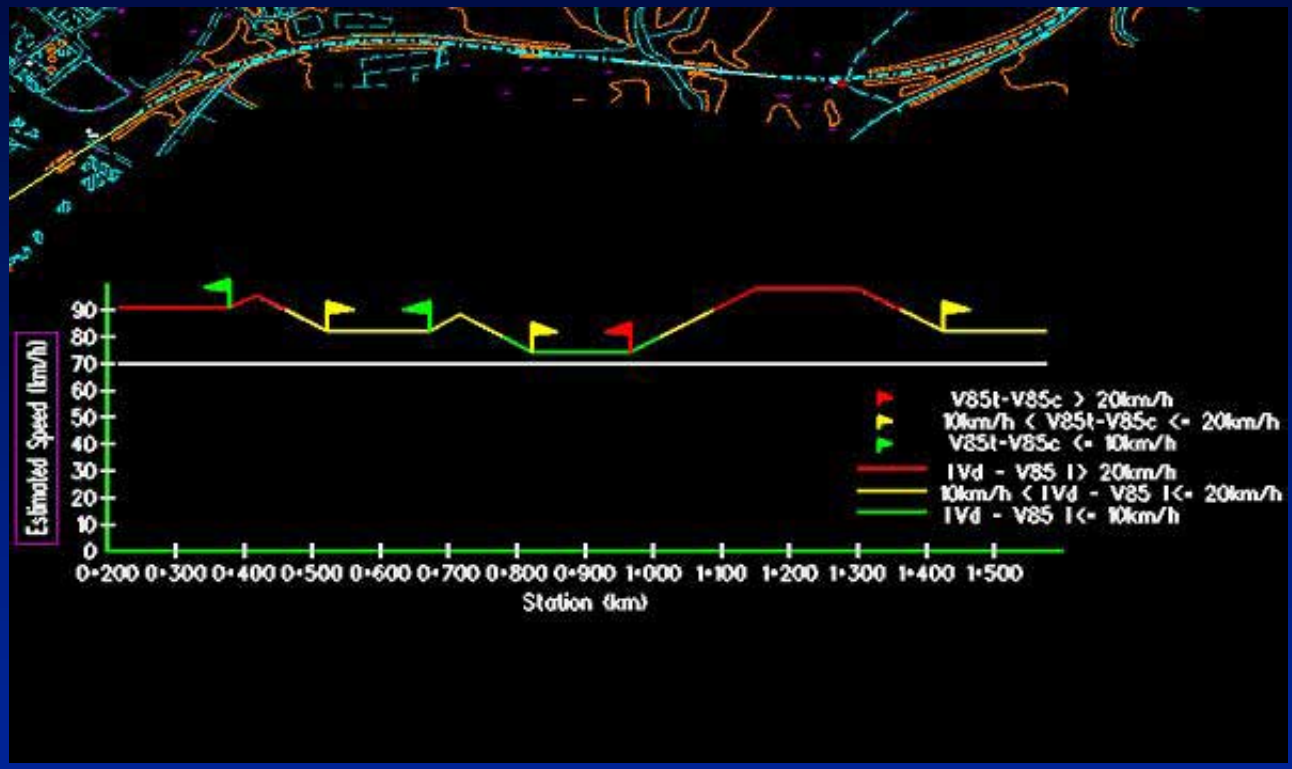
The 21st Century ‘Context Sensitive’ Highway Engineer



Develops and refines solutions based on new, performance-driven tools and techniques (not just minimization of construction cost)

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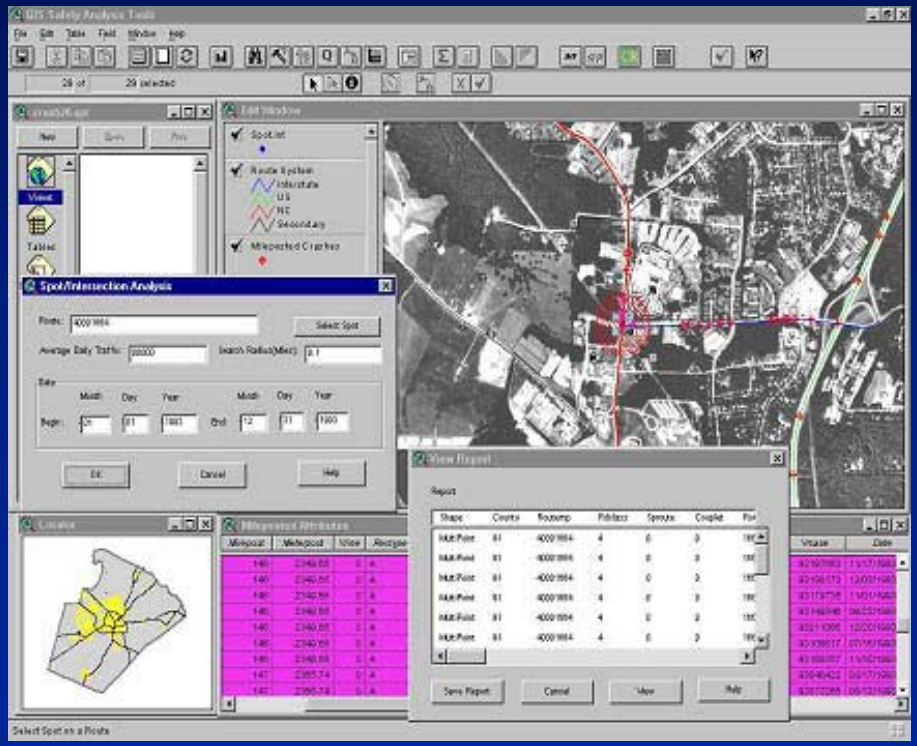
The 21st Century 'Context Sensitive' Highway Engineer employs technology to support CSD best practices

- GIS-based safety data supports decisions and alternatives
- CAE environment enables rapid production of multiple alternatives



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Technologies to support CSD (continued)

- Operational modeling (CORSIM, VISSIM) enables demonstration and understanding of complex traffic issues
- Visualization technology removes guesswork on visual impacts

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An Emerging Shift in the Skillbase Required for CSD Success

- **Current staff skills inventory**
  - –Geometric design
  - –Construction engineering
  - –Pavement and materials
  - –Technical drafting (CAD)
- **Skills needed for CSD success**
  - –Traffic operational and safety effects of design
  - –‘Design creativity’
  - –Project management
  - –Communications and facilitation

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Management and Organizational Changes to Implement CSD

- Empowerment of local project staff
  - negotiate with stakeholders
  - develop creative solutions
  - make key design decisions
- Continual investments in training and skill development
- Investments in safety management tools and techniques
- Critical review of design criteria, manuals and design processes

CSD succeeds (or fails) at the local level

Support your local 'umpire'

Staff in the field interact with stakeholders; must represent policy, weigh trade-offs, and negotiate on behalf of the DOT

–Educate them

–Empower them

–Support their decisions

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Training Opportunities Abound; Invest for Staff Skill Development

- CSD awareness
- Design, safety and operational effects of design
- NEPA/environmental process
- Speaking and communications
- Project Management
  - Resource and personnel management
  - Chartering and Partnering

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Safety Management Processes are Essential to Long Term Success of CSD

- ***Risk Management Tools and Techniques***
  - –Design exceptions processes
  - –Design study report format and contents
  - –Document management and retrieval (IT solutions)
- ***More flexible design processes and criteria***
- ***Safety Information Systems***
  - –Better crash and traffic volume data
  - –Improved key physical inventory systems (‘safety assets’)
- ***Decision support systems***
  - –High crash identification
  - –Countermeasures and treatments

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External Support from Key Stakeholders Speeds Institutionalization of CSD

- Beneficiaries of projects need to speak for themselves
  - DOT staff should not need to be project advocates, but rather facilitators
- Credible stakeholder groups will engage to remain credible
- Some policies or regulations may need review

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Stakeholders want to be involved, and respond to demonstrated needs

The good news -- stakeholders and the general public are increasingly more knowledgeable and sophisticated

- Key concepts they understand (with a little coaching and data)
  - relationships of land use to transportation
  - concepts of substantive safety
  - funding limitations and priorities (choices)
  - difficulties of construction, implementation

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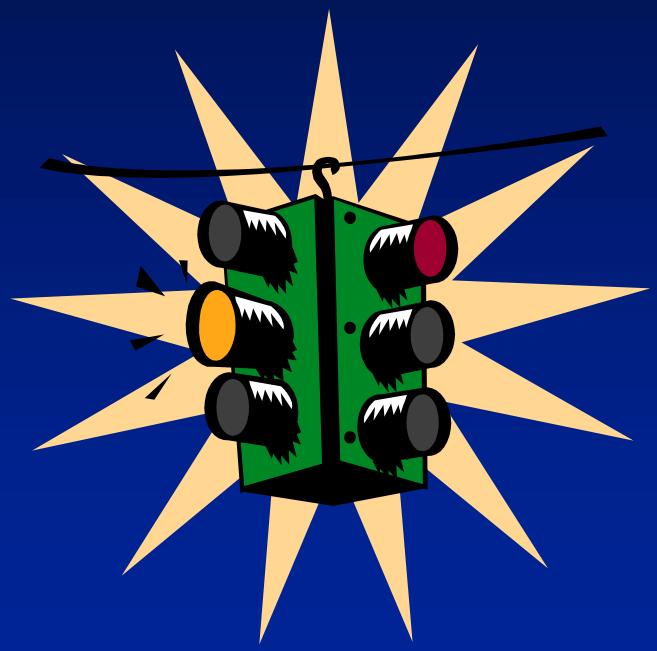
The CSD ‘Dilemma’



Do we really have a choice to make the necessary investments (capital, management, cultural, emotional)?

Context sensitive design sounds difficult and expensive!!

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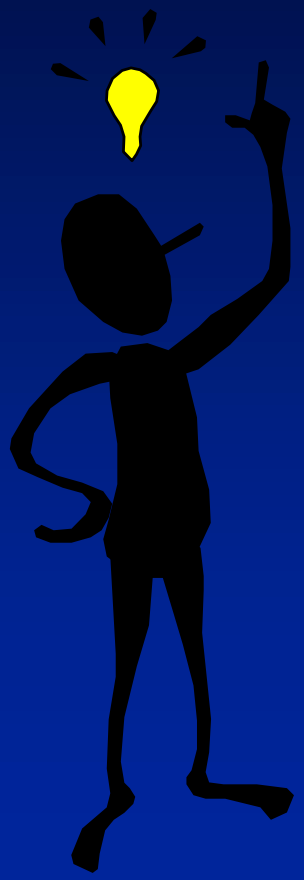
Old Joke (anonymous)



The definition of clinical insanity is doing the same thing over and over again and expecting a different result

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